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PARASITIC GASTRITIS IN SHEEP

Comparative Trials on Lambs with Phenothiazine and Copper-Nicotine Mixture

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Phenothiazine was first prepared over 50 years ago, but its usefulness in controlling certain insect pests remained undiscovered until 1934. Its anthelmintic action against nematode worms in domesticated animals has been investigated only within the last two years. Taylor and Sanderson (1940) have given a detailed account of the history and chemical nature of phenothiazine, and these and other workers in Britain have carried out numerous field trials with this substance (Taylor and Sanderson *et al.*, 1940).

In June, 1940, the present authors had an opportunity to test the value of phenothiazine in preventing losses from parasitic disease amongst lambs on two farms, which each produce approximately 300 lambs annually. On both farms parasitic disease has become troublesome during the last 10 to 15 years, and more recently routine summer dosing with copper and copper-nicotine solutions has been introduced. The dosing of lambs has generally commenced in June, but despite this, a large proportion of the lambs have been unthrifty every autumn and many have shown evidence of parasitic disease. Only about a third of them have maintained good condition. Without doubting the value of dosing lambs, it was nevertheless clear that the system adopted on these farms had not been entirely satisfactory. Apart from loss by death, the unthriftiness in the flocks has steadily increased to the proportions of a considerable farming problem.

Two experiments were therefore made to test the value of phenothiazine as an anthelmintic.

Experiment No. 1

Farm A.—This experiment was started in June and involved 100 lambs. The lambs were separated into three groups approximately equal in all respects, and these groups were identified by paint markings. In addition, seven lambs in each group were marked with numbered ear-tags in order to check their individual progress. Throughout the trial the ewes and lambs were grazed on good temporary pastures.

All lambs were weighed prior to the first dosing (13.6.40) and faecal samples were collected from the ear-tagged lambs. Egg counts were undertaken firstly by the Stoll technique, but later a modification of the Gordon-Whitlock method was adopted. The lambs in Group I were then dosed with 15 grammes of phenothiazine in capsule form (that is approximately 0·5 gramme of phenothiazine per kilogramme of body weight). Group II lambs were given 15 to 20 c.c. of copper-nicotine mixture according to size. In Group III the lambs received no treatment, and, as all the experimental sheep were grazed in one band, the untreated lambs served as controls. At intervals of 28 days the lambs were again weighed and dosed, and faecal samples taken from the numbered lambs. This trial was continued for three months, but it is to be noted that after two months the owners required the untreated control lambs to be dosed with copper-nicotine mixture. Finally, at the conclusion of the experiment *post-mortem* examinations of lambs from each group were made, and differential worm counts carried out according to the method described by Taylor, 1935.

Farm B.—An almost identical test was carried out on this farm. Here, however, the control lambs were dosed after one month (12.7.40).

RESULTS

AVERAGE GROUP LIVEWEIGHT GAINS

TABLE IA—FARM A

Dosing Group	Liveweight in Lbs.				Percentage Increase
	14.6.40	12.7.40	9.8.40	7.9.40	
1. Phenothiazine	56·66	63·3	70·9	77·6	37·1
2. Copper-Nicotine	56	63	69·9	76·0	35·7
3. Controls ...	56·8	64·1	69·0 Controls dosed	74·4	31·0

TABLE IB—FARM B

Dosing Group	Liveweight in Lbs.			Percentage Increase
	13.6.40	11.7.40	8.8.40	
Phenothiazine ...	55·7	67·3	71·1	27·6
Copper-Nicotine ...	55·6	67·3	70·7	27·1
Controls	54	62·3 Controls dosed	67·4	24·8

Tables IA and IB indicate the value of dosing, and show a slightly superior result from the use of phenothiazine. The worm egg counts from the tagged lambs showed a great reduction following dosing, particularly

in the group dosed with phenothiazine. Differential worm egg counts showed that this reduction in the phenothiazine group was almost entirely due to the elimination of the eggs of *Ostertagia* and *Trichostrongylus* species. The reduction in the copper-nicotine group was almost entirely due to the absence of *Nematodirus* species and *Moniezia*.

Experiment No. 2

This experiment was commenced on September 1st on Farm B, using 60 lambs all affected with parasitic disease. Reference to Table III shows that the average bodyweight of these lambs was little above that of average lambs in mid-June. The lambs were drawn into three equal groups and all were ear-tagged and

TABLE IIA

POST-MORTEM EXAMINATIONS—FARM "A"

Lamb No.	Dose	Number of Worms in Abomasum			Number of Worms in Small Intestine					Number of Worms in Large Intestine		Total Count
		Ostertagia spp.	*Trichostrongylus axei*	Total	*Trichostrongylus* spp.	*Cooperia* spp.	*Nematodirus filicollis*	*Moniezia expansa*	Total	*Trichuris ovis*	Total	
58	Phenothiazine	600	400	1,000	2,000	1,600	1,600	0	5,200	400	400	6,600
95		0	200	200	2,100	500	3,000	1	5,600	650	650	6,450
254	Copper-Nicotine	3,700	2,100	5,800	2,000	1,800	1,600	0	5,400	400	400	11,600
54		5,600	2,500	8,100	2,000	1,000	1,600	0	4,600	0	0	12,700
75	Controls	13,300	2,000	15,500	350	1,200	5,400	1	6,950	No count		22,450
53		14,100	1,500	15,600	300	200	2,000	0	2,500	No count		18,100
100		5,300	1,200	6,500	700	600	3,000	2	4,300	240	240	11,040

TABLE IIB

POST-MORTEM EXAMINATIONS—FARM "B"

No.	Dose	Number of Worms in Abomasum			Number of Worms in Small Intestine					Total Count
		Ostertagia spp.	*Trichostrongylus axei*	Total	*Trichostrongylus* spp.	*Cooperia* spp.	*Nematodirus filicollis*	*Moniezia expansa*	Total	
92	Phenothiazine	400	0	400	1,700	800	10,100	1	12,600	13,000
62		100	400	500	1,300	1,600	5,200	0	8,100	8,600
348	Copper-Nicotine	3,400	100	3,500	1,500	100	0	0	1,600	5,100
65		3,900	400	4,300	1,000	1,000	5,200	0	7,200	11,500
299		2,300	300	2,600	1,200	0	2,800	0	4,000	6,600
347	Controls	5,600	700	6,300	2,800	1,800	7,200	1	11,800	18,100
91		6,050	150	6,200	0	0	2,700	0	2,700	8,900
321		3,000	500	3,500	200	200	3,000	0	3,400	6,900

Tables IIA and IIB show the great reduction in the total number of worms found in lambs dosed with phenothiazine, as compared with the other groups. It is seen that phenothiazine has apparently been very effective against *Ostertagia* species and *Trichostrongylus axei*. Worms inhabiting the small intestine did not, however, appear to have been affected.

weighed. Faecal samples were taken from ten lambs in each group. Group I lambs were given 20 grammes of phenothiazine, Group II lambs received 25 c.c. of copper-nicotine-mixture, while the lambs in Group III were given a mixture consisting of 15 grammes of phenothiazine and 15 c.c. of copper-nicotine-solution. The combination of phenothiazine and copper-nicotine-mixture was included because it had been

used previously on a single heavily infested lamb with a most satisfactory result.

The egg counts were made by the modified Gordon and Whitlock method (1939).

At the end of four weeks the groups were again weighed and examined. Since only moderate progress was recorded, the above treatments were repeated at weekly intervals for a fortnight, and the experiment was concluded two weeks later.

RESULTS

Table III

Average Liveweights Throughout Test

Group	Liveweight in Lbs.		
	1.9.40	29.9.40	26.10.40
1. Phenothiazine	57·7	61·2	69·0
2. Copper-nicotine	56·0	55·6	61·9
3. Phenothiazine and Copper-Nicotine	53·7	54·1	58·0

Standard Error is ± 2·7 lbs., therefore difference is significant.

Monthly weighings showed that the lambs dosed with phenothiazine had made the best gain after four weeks. After eight weeks the superiority was marked.

Differential egg counts from the tagged lambs showed a great reduction following dosing with phenothiazine, this reduction being almost entirely due to the elimination of the eggs of *Ostertagia* spp. and *Trichostrongylus* spp. The lower total counts in the other groups were partly due to a reduction in the numbers of eggs of *Nematodirus* spp. and *Moniezia* spp.

Several points of interest emerge from an examination of the data obtained from faecal egg counts. The number of eggs detected in the faeces of Group I lambs (phenothiazine) was lower than that of the two other groups. When the egg counts are analysed to show egg-species other than *Moniezia* and *Nematodirus*, the result is more convincing. Apart from the eggs of these genera, there were very few eggs passed by the lambs dosed with phenothiazine. On the other hand, the number of eggs of genera *Moniezia* and *Nematodirus* found in the faeces of lambs dosed with copper-nicotine solution was very low.

From these facts it may be reasoned that copper-nicotine-solution either removes the mature worms *M. expansa* and *N. filicollis*, or inhibits their egg production. Conversely, it would appear that phenothiazine has little effect on these two species, but it either kills the adults of the other species commonly present in lambs or inhibits their egg production. From the results of actual worm counts made on lambs at *post-mortem* examination (Table II), it would appear that phenothiazine has both effects, *i.e.*, it removes large numbers of the more deadly *Ostertagia* species, and also prevents the production of eggs in those which remain. Examination of the faeces showed no trace of eggs of these particular species.

Thus two important points emerge. Experiment I shows that phenothiazine is efficient in removing the more harmful worms, *Moniezia* and *Nematodirus* being normally not considered pathogenic. Phenothiazine seems of greatest value in removing worms from the abomasum, but is not so efficient against the worms of the small intestine.

Experiment I illustrates the slow onset of parasitic disease in lambs, which is always well established before definite symptoms appear. The initial signs of parasitic disease are dullness of the eyes, and a slightly dry or harsh appearance of the fleece. If treatment is withheld at this stage, rapid deterioration in condition occurs. Consequently, regular monthly dosing with phenothiazine is advised. In the second experiment the lambs all showed definite symptoms of parasitic disease, and here the value of phenothiazine was convincingly demonstrated. The liveweight increase shown by this group was, at the conclusion of the trial, much greater than in either of the other two groups.

Table IV

Average Egg Counts Throughout Test

Group	Average Number of Eggs per gramme faeces 1.9.40				Average Number of Eggs per gramme faeces 28.9.40				Average Number of Eggs per gramme faeces 26.10.40			
	Eggs *Nematodirus* spp.	Eggs *Moniezia* spp.	Eggs other spp.	Total No.	Eggs *Nematodirus* spp.	Eggs *Moniezia* spp.	Eggs Other spp.	Total No.	Eggs *Nematodirus* spp.	Eggs *Moniezia* spp.	Eggs Other spp.	Total No.
Phenothiazine	360	220	2,740	3,320	160	350	160	670	310	170	100	580
Copper-Nicotine ...	780	460	2,480	3,720	90	30	2,420	2,540	30	10	1,200	1,240
Copper-Nicotine and Phenothiazine ...	800	120	4,380	5,600	10	20	3,520	3,550	20	0	1,210	1,230

DISCUSSION

When the first experiment commenced in June all the lambs appeared perfectly healthy, *i.e.*, there were no signs of parasitic disease. At the conclusion of the trial, however, the control lambs were less thrifty than their fellows, and the percentage liveweight gains in the different groups showed unmistakably that anthelmintic dosing had been beneficial. This difference would undoubtedly have been greater had it been possible to withhold treatment from the control groups throughout the test. On the basis of liveweight increase only, phenothiazine appeared to be lightly more efficient than copper-nicotine-solution.

Conclusions

(1) Under the conditions of the above trial phenothiazine proved an efficient anthelmintic for lambs, and its value was more apparent when administered to patent cases of parasitic gastritis. It proved more effective than dosing with either copper-nicotine-mixture or with a combination of copper-nicotine and phenothiazine.

(2) The effect of phenothiazine proved to be greatest on what are considered the pathogenic species, *i.e.*, *Ostertagia* and *Trichostrongylus axei*.

(3) Phenothiazine proved less effective than copper-nicotine-solution in removing *Moniezia expansa* and *Nemtodirus filicollis*.

(4) Phenothiazine removed most of the worms in the abomasum of treated lambs.

(5) A combination of phenothiazine and copper-nicotine solution was not so effective as phenothiazine alone.

(6) The experiments indicate that phenothiazine is a valuable anthelmintic for sheep, and its wide use is recommended.

Summary

Field trials have been made with lambs to test the anthelmintic efficiency of phenothiazine as compared with that of copper-nicotine-mixture. Phenothiazine proved more efficient than copper-nicotine-mixture against the worms which usually produce parasitic disease. A combination of both these anthelmintics was tried and found to be less effective than phenothiazine alone. Wide use of phenothiazine is recommended.

Acknowledgements.—The phenothiazine used in these experiments was supplied by the Agricultural Research Council.

References

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CHARGE OF DUBLIN CITY ABATTOIR

Dublin's Chief Veterinary Officer, Mr. P. F. Dolan, has been recommended to take complete charge of the Dublin Municipal Abattoir. This was stated by the City Manager (Mr. P. J. Hernon) at a Corporation meeting during a discussion on a motion by Mr. James Larkin requesting the Manager to recognise the claim of the abattoir's Acting Superintendent (Mr. John A. McDonald) to be Superintendent at the abattoir.

Mr. Hernon informed the meeting at the opening of the discussion that the recommendation was a managerial function and that he had already made his recommendation to the Local Government Department. Mr. Larkin decided to press his motion as a tribute to the work of Mr. McDonald. The motion was supported by several members. Mr. Patrick Belton opposed it, and when he heard of Mr. Dolan's nomination he expressed his gratification at the City Manager's recommendation.

The motion was carried, Messrs. Belton and Sean Milroy dissenting.

FIELD TRIALS WITH PHENOTHIAZINE ON LAMBS

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The observations described in this report were carried out on a farm in Roxburghshire where some loss from worm infestation in lambs had occurred in previous years. On most farms in the area the pastures are mainly stocked with sheep and the majority of farmers are obliged to use some form of anthelmintic treatment to enable their lambs to resist infection. Symptoms usually begin to appear in the early part of June and continue throughout the summer. Dosing is carried out two or three times during the season, an interval of about a month being allowed between doses. In bad cases more frequent dosing is necessary and a change of pasture is given wherever possible. On this particular farm the administration of a solution of sulphate of copper and nicotine sulphate had given fairly successful results in the past, but it was realised that there was room for the introduction of a more effective remedy.

Plan of Experiment.—A group of 81 Oxford-cross lambs which were the progeny of 40 half-bred ewes were divided into three equal lots on May 20th, 1940. They had been grazed together on an 18-acre field of third year's grass and they continued on this pasture during the early part of the test. Treatment was given as follows: Group (1) phenothiazine, Group (2) sulphate of copper and nicotine sulphate, Group (3) no treatment. The lambs represented a secondary draw from the main flock and were, in the circumstances, likely to be suffering from a measure of helminth infestation that would show some response to treatment. No concentrates were fed at any time during the test.

Dosing took place three times during the summer, *viz.*, on May 23rd, June 19th and on July 19th. The lambs had been born in the latter half of March, and when dosing began they ranged from seven and a half to ten weeks of age. All the ewes and lambs ran together as one flock throughout the experiment. Weighing was carried out periodically, and faeces were taken for worm egg-counts on each occasion when the lambs were dosed and on three other occasions.

Dosage:

Phenothiazine (Group I).

The phenothiazine was administered in the form of the suspension known as "Phenovis."

The dose was computed on the basis of 0·3 gramme of phenothiazine per lb. body weight, and the dose was increased during the course of the experiment to allow for the increase of body weight.

Copper-Nicotine Sulphate (Group II).

The solution employed was a 1 per cent. solution of sulphate of copper along with 0·6 per cent. of nicotine sulphate (40 per cent. solution). A dosage of 1½ fluid ounces was used to begin with and this was increased by ½ fluid ounce per head at each subsequent dosing. Allowance was made according to the size of the lambs, the bigger lambs receiving larger doses.

Progress of the Lambs.—At the date of commencement of the test, some of the lambs in each group were rather unthrifty in appearance. All groups contained large and small lambs equally divided, and there were equal numbers of both sexes. The field of third year's grass in which they were grazed had carried ewes and lambs during the two preceding seasons so that a good deal of helminth infestation was presumably present. In the early stages, both the treated groups made good progress but the controls gradually fell back in condition and a good deal of scouring developed. By June 19th their condition became so bad that it was deemed necessary to shift them to clean pasture if serious depreciation and loss through death were to be avoided. Accordingly, the whole flock was moved to a field of first year's grass on the above date. After this the controls began to improve and the other groups continued to make good progress. It was unfortunate for the sake of the experiment that this change had to be given as it interfered with the course of the disease and resulted in a less clear-cut picture between treated and untreated groups. However, it could not be avoided for practical reasons.

Scouring.—Throughout the experiment there was a greater incidence of scouring among the control lambs. Counts of the number of scouring lambs were made on five occasions when faeces were being taken for worm egg-counts and the total number recorded was as follows :

	Number of Scouring Lambs		*Total*
	Slightly	*Badly*	
Phenothiazine Group ...	6	3	9
Sulphate of Copper and Nicotine Sulphate Group ...	11	5	16
Control Group ...	21	10	31

Deaths.—There were three deaths in the control group and two deaths in each of the others. The causes of these deaths are discussed later.

General Appearance.—At the conclusion of the experiment in August, the phenothiazine group were rather more vigorous and alert and seemed in better bloom than the other groups. The sulphate of copper group were not quite so attractive in appearance and a few of the lambs were somewhat drawn up in the belly. The controls were visibly poorer and had not thriven as well as the other groups. The general appearance of the lambs seemed to indicate that phenothiazine had given better results than sulphate of copper.

Weight Increases.—The average weights of the groups at the beginning and end of the experiment were as follows :

	May 20th	*August 20th*	*Increases*
	Lb.	*Lb.*	*Lb.*
Phenothiazine Group ...	41·5	74·3	32·8
Sulphate of Copper and Nicotine Sulphate Group	41·0	70·7	29·7
Control Group	41·8	69·8	28·0

The phenothiazine group showed an increase of 4·8 lb. per head over the controls, and the sulphate of copper group an increase of 1·7 lb. over the control group.

Egg-counts

Composite egg-counts were made at intervals of two weeks, from the first dosing on May 23rd until the third dosing on July 19th. Four weeks after the third and final dosing, individual counts were made. The average results obtained from the counts are embodied in the tables below.

There was an apparent seasonal rise in the severity of the infestation with *Nematodirus filicollis*, and to avoid masking the effect of treatment on other parasites, a separate count was made of the readily recognisable eggs of this worm. An additional table is appended, showing the final individual counts. The McMaster egg-counting technique was employed throughout the investigation and proved to be both rapid and reliable.

Table I

Composite Egg-counts of the Experimental Group for all Worms Except Nematodirus

Date of Count		I Phenothiazine E.P.G.	II Copper-Nicotine E.P.G.	III Controls E.P.G.
First dose ...	23.5.40	560	760	580
	6.6.40	170	680	570
Second dose ...	19.6.40*	600	660	1,200
	3.7.40	300	560	720
Third dose ...	19.7.40	340	460	860
	20.8.40	280	630	1,170

* On this date, all the lambs were moved to fresh pasture.

Table II

Composite Egg-counts of the Experimental Groups for Nematodirus

Date of Count		I Phenothiazine E.P.G.	II Copper-Nicotine E.P.G.	III Controls E.P.G.
First dose ...	23.5.40	300	300	170
	6.6.40	570	360	460
Second dose ...	19.6.40*	1,200	620	1,060
	3.7.40	200	600	600
Third dose ...	19.7.40	60	60	30
	20.8.40	30	130	200

* On this date, all the lambs were moved to fresh pasture.

(*For Table III*: *Final Individual Egg Counts—see top of col.* 1, *page* 172.)

DISCUSSION

Table I shows that in the phenothiazine group, a substantial reduction in the egg-count followed each administration of the drug, the count rising again after the expiry of a month, as might be expected. The final count, taken one month after the third dosing, shows a reduction of 50 per cent. on the original count; in the copper-nicotine group, on the other hand, the reduction after each dose is much less marked, and the final count shows a decrease of only 17 per cent. on the original count. In the control group, the counts show that the level of infestation rose until the lambs were moved to fresh pasture. This change was followed by a reduction and then another steady rise took place until the final count showed an increase of 100 per cent. over the original count.

TABLE III

FINAL INDIVIDUAL EGG-COUNTS, TAKEN FOUR WEEKS AFTER THE FINAL DOSING

Group I Phenothiazine		Group II Copper-Nicotine		Group III Controls	
Other spp.	*N. filicollis*	Other spp.	*N. filicolis*	Other spp.	*N. filicollis*
60	0	1,860	0	60	60
520	0	460	0	1,400	1,000
60	0	200	0	200	0
1,280	120	520	400	320	0
1,460	0	860	0	7,200	1,800
60	0	460	60	400	0
800	120	320	0	60	0
80	120	200	320	800	0
460	0	480	120	2,000	200
60	0	1,000	1,200	7,160	400
800	320	60	0	1,080	120
60	0	640	0	400	0
60	0	660	260	400	0
0	0	600	0	400	0
60	0	260	0	400	60
200	0	600	60	400	60
120	0	800	520	520	400
0	0	660	0	1,000	0
60	0	120	0	800	0
260	0	460	0	860	260
120	0	1,680	120	540	120
0	0	400	0	200	0
60	0	1,260	0	260	200
6,640	680	14,560	3,060	26,860	4,680
Averages to nearest 10 :—					
280	30	630	130	1,170	200

Table II shows the counts for *Nematodirus filicollis*. In all three groups, the level of infestation rose rapidly to reach a peak in the middle of June, and thereafter declined until an almost negligible degree was reached towards the end of August. It would seem that neither phenothiazine nor copper-nicotine mixture was effective in the case of this parasite.

Table III shows the individual egg-counts at the conclusion of the experiment, one month after the final dosing. In Group I, only 4 animals out of 24 retained a *Nematodirus* infestation great enough to be recorded by the technique employed. In Group II, 9 animals out of 23, and in Group III, 12 out of 23 retained infestations. The almost complete disappearance of *Nematodirus* from Group I is perhaps due to the better condition of the animals in this group, and not directly due to the administration of phenothiazine.

For other parasites, the final average counts for the three groups differ considerably, although taken one month after the final dosing, and it has been ascertained that the differences are statistically significant.

POST-MORTEM EXAMINATIONS

Post-mortem examinations were carried out on four of the lambs which died during the experiment. Individual counts were made of the larger species recovered and estimated figures were obtained for the smaller forms. One lamb in the control group was lost and later found dead in a ditch ; as decomposition was advanced, no *post-mortem* examination was possible.

Lamb from Group I. Died from pulpy kidney on 25.5.40, about 36 hours after the first dose.

		Number of Worms Recovered
Fourth Stomach	—	None
Small Intestine	*Nematodirus filicollis*	2,600
Caecum and Large Intestine ...	*N. filicollis* ...	250

Lamb from Group I. Died 26.7.40, one week after third dose.

This lamb was one of triplets and at the commencement of the observations it was a poor stunted animal ; its condition gradually deteriorated ; *post-mortem* examination showed consolidation of the apical lobes of the lungs.

		Number of Worms Recovered
Fourth Stomach	*Haemonchus contortus*	200*
Small Intestine	*N. filicollis* ...	400
	Trichostrongylus spp.	200
	Moniezia expansa ...	5
Caecum and Large Intestine ...	*Trichuris ovis* ...	9
Lungs	*Dictyocaulus filaria*	5

* All immature.

Lamb from Group II. Died 27.6.40, eight days after second dose. Showed symptoms usually associated with worm infestation ; no gross *post-mortem* lesions.

		Number of Worms Recovered
Fourth Stomach	*Ostertagia circumcincta*	750
Small Intestine	*N. filicollis*	21,000
Caecum and Large Intestine ...	*T. ovis*	17

Lamb from Group III. Died 15.6.40. No gross *post-mortem* lesions.

		Number of Worms Recovered
Fourth Stomach	*O. circumcincta* ...	3,600
Small Intestine	*Trichostrongylus* spp.	200
	N. filicollis	25,000
	O. circumcincta ...	250
Caecum and Large Intestine ...	—	None

These *post-mortem* examinations are of interest in that they show the effect of treatment on individual species.

The first lamb from Group I, which died 36 hours after the first dose, retained no stomach worms but harboured a fair number of *N. filicollis*. The second lamb from Group I, which died one week after the third dose, had, it is true, 200 *H. contortus*, but all these were immature. They were considered, however, to be too large to have been acquired since the last dose, so that one may conclude that phenothiazine is not 100 per cent. effective against immature forms of this species. The examination of this lamb also shows that the drug is not effective against *M. expansa*, *T. ovis* and *D. filaria*, and that it does not eliminate all the small Trichostrongyles in the small intestine. The small number of *N. filicollis* recovered from this lamb cannot be attributed to the effect of phenothiazine, since the data obtained from all the lambs shows that they were throwing off infection with this species at the time the animal died.

SUMMARY OF RESULTS OBTAINED ON *POST-MORTEM* EXAMINATION

NUMBERS OF WORMS RECOVERED AT AUTOPSY

Date of Death		*Haemonchus contortus*	*Ostertagia circumcincta*	*Nematodirus filicollis*	*Trichostrongylus* spp.	*Moniezia expansa*	*Trichuris ovis*	*Dictyocaulus filaria*
25.5.40	Group I lamb	0	0	2,850	0	0	0	0
26.7.40.	Group I lamb	200 (imm.)	0	400	200	5	9	5
27.6.40.	Group II lamb	0	750	21,000	0	0	17	0
15.6.40.	Group III lamb	0	3,850	25,000	200	0	0	0

The lamb from Group II, which died eight days after the second dose of copper-nicotine mixture, still harboured some *O. circumcincta*, and it would also appear that the dose had little effect on *N. filicollis* or *T. ovis*.

The Control lamb, which died in the middle of June, carried a moderately heavy infestation of stomach worms and a very large number of *N. filicollis*. It may be noted that this animal died when the infection with the latter species was at its peak, as is shown in Table II.

Conclusions

On the evidence of the egg-counts, the weights, and the *post-mortem* examinations, phenothiazine is a more effective anthelmintic for sheep than the copper-nicotine mixture. While the copper-nicotine mixture is less effective than phenothiazine, it is shown to be of some value when the results are compared with the group receiving no treatment.

Acknowledgments.—We are indebted to Mr. H. Usher for providing facilities for conducting these observations and for his active co-operation throughout. Dr. A. C. Aitken, F.R.S., kindly assisted us in the statistical analysis of the data.

The work was carried out under the co-ordination of the Agricultural Research Council, who supplied us with the phenothiazine.

HORSES NEED NO IMPORTED "FUEL"

Under the above heading, Mr. James Forshaw, the noted breeder, writes in the March 4th issue of the *Farmer and Stockbreeder*: "In going about the country and cities it is evident that there are still thousands of draught horses at work in our cities doing all kinds of carrying work. In such cities as Manchester, Liverpool, Bradford, Hull, and other big industrial centres the type of horse used is chiefly one of 16·2½ to 17 hands, full of muscle and big hard flat bone, solid feet with an active swinging stroke, taking his 1 to 2½ tons without trouble or distress . . . One can only come to the conclusion that so long as this class of horse is obtainable and therefore produced, so long will there be a demand for him. His value for work in cities comes from various causes. One is that he can take big loads into and out of very awkward places. He is interchangeable from lorry to cart or to chains and dependable in all kinds of weather.

On the Farm

"Now about horses in agriculture. At the moment the tractor is doing much work on the land and very useful work, too, but for farmers of from 150 acres downwards horses come into their own, with such work as hoeing roots, potatoes, etc., taking manure on to soft ground from awkward farmsteads, also keeping a running team from the hayfield or cornfield.

"A good farmer always has managed and always will manage to get his seed land ready and seeds planted by the proper time with horses. Although horses are not so fast as the tractor they get there just the same. I know of one farmer who works 76 horses on his extensive farm in Lincolnshire to-day.

"Horses do not necessarily require any food from abroad. They can live well on home-produced food and are an asset in time of war on that account. Moreover, the manure they leave behind helps the fertility of the farm.

"Now as to the type, especially of Shires, of the future—I would rather say types—I am convinced that there will always (as far as one can visualise) be a demand for draught horses, which, of course, will fluctuate as the general trade of the country fluctuates. I would say to those with pure-bred Shire mare or mares of that type: Do go in for breeding the class of horses seen in our cities. With size and power they are in request at 4½ years upwards, so that such horses do the farm work for two or more years and then can be cashed.

"Then there is the other class: the clean-legged active horse, more or less of the vanner type. He is in great request for almost all kinds of agricultural work. He can take a good load and get off the mark quickly and is also used for the lighter commercial loads and quick work. Standing 16·1 to 16·3 hands, with eleven inches of good bone, solid feet that can stand the hard road—with short back and thick middle—walking or trotting makes little difference to this plucky horse. He is often the progeny of a Shire stallion from a clean-legged cart mare.

"Breeders who rear, and rearers, should break all 2-year-olds to light work. Nothing helps the sale of young horses like working them. Remember that in breeding any livestock there are always periods of ups and downs and very often the lucky man is the one that keeps on breeding."

* * * * *

VETERINARY SERVICES IN TASMANIA

The scheme for expanding veterinary services in Tasmania will be advanced another step when Messrs. N. Needham and M. F. Pulsford join the staff of the animal health service of the Department of Agriculture at the beginning of next year. Making this announcement, the Minister for Agriculture (Mr. D'Alton) said the two officers would be in addition to Mr. Wakefield Rainey, who took up duties some little time ago. It was also expected that two more veterinary surgeons would be added to the staff after the University degree examinations this year. Mr. D'Alton said that these arrangements would provide the animal health service with its full complement of qualified veterinary surgeons to enable the nationalisation scheme to be put into effect throughout the state.

Trichina Infection of Meat*

E. J. BURNDRED, M.C., M.R.C.V.S., D.V.H.

The infection of pork with the *Trichina spiralis* has been known for a long time, but, like so many things, has not been considered to be of sufficient importance in this country to warrant examination for its presence.

As far as I know, no attempt has been made by anyone to ascertain to what extent the infection exists, but I remember that a considerable number of years ago Sir Stewart Stockman recorded the existence of this parasite on rat-ridden premises where swine fever existed; and a report of infection in Wales was recorded in the Annual Report of the Chief Medical Officer to the Ministry of Health a year or two ago.

I have seen on my visits to abattoirs abroad regular routine microscopical examination of pieces of pork, usually cut with scissors from the pillars of the diaphragm, about the size of a small oat, and pressed between two pieces of glass which could be clamped firmly together, and marked in numbered squares. An improvised apparatus could probably be made by the use of a ciné projector as the lantern. Latterly, however, the trichinoscope has been in regular use, and in most abattoirs a number of lanterns and screens were in use at the same time in darkened rooms. In a city like Prague, for instance, half a dozen sets of apparatus would be in operation simultaneously.

We have not yet considered it necessary to institute such examination even experimentally, but in view of the current outbreak in the Midlands, one would like to see at least one big abattoir where considerable pig killings take place, devote at least some time in proving, either that the infection is not present, or its extent and distribution.

It will possibly not be inopportune for me to draw attention to the difference between meat inspection in England and abroad in connection with the emergency slaughtered animal. In England, apart from the occasional use of the microscope when anthrax is suspected, no very thorough examination of carcases of such animals is carried out.

It is routine procedure abroad for the carcase to be left until a bacteriological examination of various organs—such as kidney, liver and lymphatic gland—and meat has been carried out. Such an examination prior to a decision relieves the inspector of much of the responsibility which would otherwise be carried by him.

A comparison between the staff employed in the abattoir in Prague in 1937 and an abattoir serving a city of similar size in England should prove interesting. Prague abattoir was controlled by a director who was a veterinary surgeon. The staff consisted of 17 veterinary surgeons, one market commissary, eight accountancy clerks, six clerks of lower grade, 150 employees such as cleaners, doormen, weighing machine men, engineers, etc., and seven policemen were employed.

In 1930, the last year for which I have figures, 22,361 bulls, 24,525 bullocks, 8,273 cows, 16,060 heifers, 17,643 calves, 35,405 sheep, 379 lambs, 20 goats, 92 kids, 434,427 pigs, 4,736 horses, 399 foals and 27 asses were included in a grand total of 565,486 animals slaughtered.

*The publication of this communication is rendered the more timely by the fact that, as our Parliamentary column bears witness this week, recent outbreaks of trichiniasis are causing public concern.—*Editor.*

THE VETERINARY RECORD

March 22nd, 1941.

FOOT-AND-MOUTH DISEASE

THE extensive series of outbreaks of foot-and-mouth disease which have occurred in various parts of the country during the past few months have caused considerable anxiety to the authorities responsible for its control and eradication, and concern in agricultural circles. In addition to the difficulties experienced in dealing with outbreaks under war-time conditions, the Ministry has had to contend with a large number of cases in which there has been evidence that the animals had been ailing for several days before the case was reported. Such cases have increased to an alarming extent and it is felt that a special warning is again required to remind stock-owners and veterinary surgeons of the necessity of reporting any suspicious cases to the police with all speed, and in this way bringing into operation the effective measures of control necessary to secure rapid eradication of the disease.

In dealing with such a highly infectious virus as that of foot-and-mouth disease, the two most essential factors necessary for success in controlling spread of infection are prompt notification of the disease in its earliest stages, and prompt slaughter of the affected animals in order to prevent manufacture of virus. It is therefore imperative that the slightest suspicion of the disease should be reported immediately to the proper authorities.

The veterinary profession as a whole undoubtedly appreciates its responsibilities in connection with foot-and-mouth disease, and loyally co-operates and assists the authorities in every way, but it is regrettable that there have been a few cases in which the veterinary surgeon who was called in to examine ailing animals in a private capacity failed to recognise or suspect the disease in its early stages with the result that there was not only delay in reporting, but meanwhile infection was spread to other premises. Moreover, the need for taking every precaution by way of wearing suitable overall clothing and rubber boots when visiting suspected cases and carrying out a most thorough disinfection of hands, overall clothing and boots, both before entering and leaving the premises, cannot be too strongly emphasised.

The legal liability of the owner is fully defined in Article 1 of the Foot-and-Mouth Disease (Amendment) Order of 1938, which requires him to report any suspicion of this disease in an animal or carcase with all practicable speed to a constable of the police force. Moreover Section 57 of the Diseases of Animals Acts, 1894, provides that "where the owner or person in charge of an animal is charged with an offence against this Act relative to disease or to any illness of the animal, he shall be presumed to have known of the existence of the disease or illness, unless or until he shows to the satisfaction of the Court that he had not knowledge thereof,

and could not with reasonable diligence have obtained that knowledge."

Article 1 of the Foot-and-Mouth Disease (Amendment) Order of 1938 also defines the responsibilities of veterinary surgeons as follows: "A Veterinary Surgeon who examines any animal or carcase of any animal, and is of the opinion that the animal is affected with Foot-and-Mouth Disease, or was so affected when it died or was slaughtered, or suspects that the animal or carcase is or was so affected, shall with all practicable speed give notice of the affection or suspicion of affection to a constable of the Police force for the Police area in which the animal or carcase is or was."

Unlike the owner, therefore, the veterinary surgeon is absolved from legal liability for failure to report the suspicion of the existence of foot-and-mouth disease if he is of the opinion after the examination of any particular animal that its condition is due to some cause other than foot-and-mouth disease, provided that he exercises due care in reaching that opinion. This, however, does not absolve him from the moral responsibility of reporting to the police any case where the possibility of foot-and-mouth disease cannot be excluded, even if in his opinion the trouble is probably due to another cause. But in addition to this serious responsibility, which in the national interest attaches to every veterinary surgeon as well as to every owner, to keep an ever-watchful eye for the slightest suspicion of the disease and to report immediately to the police, the interests of the profession are involved. The unfortunate results which may be the consequence of failure on the part of a practitioner to suspect the existence of the disease and which thus, by the delay in reporting, prevents administrative control being imposed promptly, are naturally liable to lead to adverse criticism by farmers and also to a loss of confidence by them in their veterinary advisers which the negligence of the individual would not warrant.

PRICES FOR SLAUGHTERED STOCK

The Ministry of Food announces that where premises are infected with swine fever or sheep scab, so that the restrictions under the Diseases of Animals Acts require fat stock to be sent direct to a slaughterhouse instead of to a collecting centre, the full price, and not the casualty price, will be paid for fat stock for which the usual twelve days' notice has been given to the district chairman of auctioneers, if such stock is accompanied by a licence issued under the Acts. Where sheep from a farm infected with sheep scab are licensed a deduction of 6d. a sheep will be made to cover the cost of disinfection of the skins and loss due to inferior skins.

If, with the permission of a Ministry of Agriculture inspector, arrangements are made for the slaughter of animals from premises within two miles of a place infected with foot-and-mouth disease, the full price will be paid if the usual twelve days' notice has been given.

The full price a score will also be payable, without the usual twelve days' notice, for pigs which are moved, under a licence, direct to a slaughterhouse from premises infected with swine fever. The price will be calculated on the weights of the carcases fit for human consumption. No insurance deductions will be made.

CLINICAL COMMUNICATION

Canine Hysteria and Diet Deficiency

J. P. ALLEN POTTS, M.R.C.V.S.,
BISHOP AUCKLAND

I have chosen five typical cases of hysteria from numerous patients treated in the last three years. The patients were :—

(1) Bull Mastiff Bitch. Age two years ; fat, constipated. *Diet.*—Hound meal soaked in gravy ; one meal a day.

(2) Fox Terrier Dog. Age five years ; thin ; slight gastritis ; poor appetite. *Diet.*—Dog biscuits, potatoes and gravy ; one meal a day.

(3) Cocker Spaniel Bitch. Age three and a half years ; very fat ; chronic constipation ; partial paralysis of hind legs. *Diet.*—Hound meal, bread, potatoes and gravy ; one meal a day.

(4) Cross-bred Airedale Dog. Age 15 months ; slight gastritis, inflammation of anal glands. *Diet.*—Dry biscuits, porridge, potatoes, bread, scraps (no meat ever given) ; one meal a day.

(5) Border Terrier Bitch. Age seven years ; fat ; evidence of tapeworms. *Diet.*—Mainly household scraps, crusts, potatoes, vegetables, small amount of dry dog biscuits.

All the above cases suffered from intermittent attacks of hysteria.

SYMPTOMS.—In all cases the symptoms differed little from the following :

Uneasiness, followed by whining and restlessness developing into barking, howling and running fits. Followed by quiescent periods in which the animal lies curled in a ball, apparently asleep, but with eyes open and staring and the pupils dilated. Animals dislike being handled and appear hypersensitive to the touch.

There is no recognition of the owner's voice. In some cases, periods of wandering aimlessly round the room, walking into any objects in their way. There was no evidence of any of the animals turning savage. These symptoms last from 2 to 24 hours, with intermittent recurrence.

TREATMENT.—In the excitable stage—that at which usually the practitioner is consulted—the patients were given ¼ to ½ a grain of luminal, according to the weight of the patient, repeated if necessary in four hours. The animals were then placed in a semi-darkened room, being kept under observation when possible. In the majority of cases this sedative treatment proved sufficient and the dogs returned to normal in 24 hours. Any other abnormal conditions existing, *e.g.*, constipation, gastritis, worms, etc., were then suitably treated.

Diet.—The patients in every case were placed on a fluid diet (warm milk and raw egg), then gradually brought on to a full diet consisting of the following :

Three meals a day of moderate size : 9 a.m., milk ; 1 p.m., dry rusked wholemeal brown bread , 6 p.m., meat meal of horse flesh, tripe, liver, bullock's heart, rabbit or white fish—partially boiled and fed as dry as possible. Raw meat was given once a week, and raw carrot was grated over meat three times a week.

OBSERVATIONS.—Hysteria did not recur in any case that was kept on the prescribed diet. Apart from the

(*Concluded at foot of col.* 1, *page* 176.)

ABSTRACTS

[MASTITIS IN DAIRY HERDS. Contributed article: *Vet. J.* **96**. 375.]

This article constitutes a résumé of recent investigations into a problem which now more than ever is of great economic importance. The four main types of mastitis, due to *Str. agalactiae*; various other streptococci; *Corynebacterium pyogenes*, and staphylococci are summarised, together with brief notes on their clinical manifestations. In the examination on the farm of animals for chronic mastitis (due to *Str. agalactiae*), it is important to note: (1) the history of the cow, *e.g.*, any abnormality noted at any time in milk, udder or milk yield unassociated with other symptoms; (2) the presence of any clots, or a very watery type of milk; (3) the reaction to brom-cresol-purple paper. Abnormally alkaline milk, indicating infection, gives a purplish tint, compared with the yellowish-green colour produced by normal milk. It is emphasised that in order satisfactorily to control chronic mastitis, laboratory assistance is essential as without cultural examination only about 41 per cent. of the cases are detected.

Control and eradication of infection in a herd is mainly dependent upon early detection of all infected cattle, followed by good management and hygiene, as experience has shown that the disease does not arise spontaneously once reservoirs of infection are removed. Two laboratory tests must be made, the first from mixed quarter samples of each cow, after which those revealing streptococci must be segregated. Two months later a second more thorough investigation is carried out on each separate quarter of apparently healthy cattle and there should be subsequent examination at intervals of three to six months to discover latent infections.

Having established a clean herd, great care must be taken to maintain its freedom from infection. If it is not possible to have a separate shed and milkers for infected cattle, these should always be milked last. New purchases should be isolated and treated with suspicion until they have been tested. Influences which may lower resistance, *e.g.*, incomplete milking and udder injuries, must be avoided.

Regarding treatment, it appears probable that, once infected, the cow harbours the infection indefinitely, though it may be latent. Various treatments including vaccination with autogenous or polyvalent vaccines; udder injection with chemicals such as entozon (1 in 1,250) and acriflavine (1 in 10,000) and trypaflavine, and chemotherapy with sulphanilamide by the mouth, have been tried with varying degrees of success. The last named often gives spectacular improvements in the character of the secretion, but does not get rid of the infection.

The author gives eleven references of particular use on the subject.

A. E. K.

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primary sedative treatment and correction of constipation, etc., no medicine was given.

It would appear that a deficiency in the diet, if not the actual cause of hysteria, is a predisposing factor, and that this deficiency is counteracted by a constituent found in fresh meat and milk.

[TESTS WITH MISCELLANEOUS SUBSTANCES FOR THE REMOVAL OF TAPEWORMS FROM POULTRY. Harwood, P. D., and Guthrie, J. A. (1940.) *J. Amer. vet. med. Ass.* **97**. 248-253.]

This article contains an excellent bibliography of 51 references and gives lists of the large number of substances and mixtures which have been either recommended for the removal of poultry tapeworms or recorded as being useless. The authors tested 223 substances and 27 mixtures, including all the well-known so-called remedies, on both naturally and experimentally infected chickens, the latter being bought as chickens one day old and reared free from tapeworms. Meal beetles (*Tribolium* spp.) were fed on gravid segments of *Raillietina cesticillus*. After four to five weeks the mature cysticercoids in these beetles were removed by Horsfall's method (to which the reference is given), and a definite number of cysticercoids was given to each chick when it was five to six weeks old.

Two weeks or more later each chick was confined in a separate compartment of a laying battery with a wire floor through which droppings passed into a pan containing a little water. The drugs tested were given in gelatin capsules after a fast of 18 hours, the regular feed being given four hours later. Each bird was weighed periodically till autopsy and two weeks after treatment, when the birds were examined for tapeworms and pathological conditions due to the drugs used. For the first four days after treatment the faeces were collected daily and examined. For the naturally infected chickens "essentially the same procedure" was used.

None of the drugs tested could be recommended. Synthetic pellieterine hydrochloride in doses of 50 to 300 mg. per bird removed all the *Raillietina tetragona* but "was ineffective for the removal of *R. cesticillus*."

Results with inorganic arsenic compounds were more encouraging, but all of them except lead arsenate had to be eliminated because of their toxicity. Lead arsenate had a significant value for the removal of *R. cesticillus*, but it retarded the rate of growth of the birds and caused necrosis of the liver in 7 out of 40 birds tested, the remainder recovering at the end of two weeks. Chickens weighing 1,500 grammes or more withstood 1 gramme of lead arsenate containing a deflocculator, but the same dose of chemically pure lead arsenate killed some of them.

The authors conclude that lead arsenate alone of all the substances tested showed any promise, but that this was so toxic that it could not be recommended.

G. L.

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[LISTERELLA: THE ORGANISM (2 articles) AND A SHORT RECORD OF SPONTANEOUS INFECTION IN A RABBIT. Paterson, J. S. (1940.) *J. Path. Bact.* **51**. 427-442.]

The author studied the antigenic structure of 54 strains of this organism and found that these strains could be grouped into four types. There was no relationship between the type of strain and the host or the geographical distribution. The two largest types comprised 43 strains and the hosts were rodents, man and poultry in one type and ruminants, fox, man and poultry in the other type. The other two types were isolated from the human subject.

The effects of inoculating nine different strains of this organism into the allantoic sac of 14-day chick

embryos were examined. Eight of these strains produced identical effects which comprised lesions in the chorio-allantoic membrane, liver, heart and central nervous system, which closely resembled those of natural infection. Infection of the nervous system occurred apparently *via* the blood stream. One non-virulent strain produced less marked effects and three rough variants failed to set up infection.

Listerella was first shown to be the causal agent of disease in rabbits in 1926 at Cambridge (Murray, Webb and Swann). No further case was observed until 1940, when a young maiden rabbit of the Copenhagen breed which had recently arrived and had not been in contact with any previous stock had to be destroyed due to severe illness six days after she should have littered down. *Post-mortem* examination revealed small greyish foci in the liver and a much enlarged uterus containing six dehydrated foetuses (developmental stage approximately 16 days) and a thick layer of inspissated pus. The uterine pus, spleen, and liver of the mother yielded pure cultures of listerella as also did the abdominal cavity of one foetus. D. W. B. T.

IN PARLIAMENT

The following are among the questions and answers recently recorded in the House of Commons:—

Foot-and-Mouth Disease

General Sir George Jeffreys asked the Minister of Agriculture how many days' meat ration for the country is represented by the animals slaughtered since the start of the war for actual or potential infection by foot-and-mouth disease; and whether, if slaughter is still insisted on in the case of infected animals, it can, in the interests of food, be restricted in the case of those animals which are not actually diseased?

The Minister of Agriculture (Mr. R. S. Hudson): The total number of animals slaughtered on account of foot-and-mouth disease since the outbreak of war represents less than one day's meat ration for the whole of the country. The majority of the carcases were salvaged for human consumption. The number of carcases actually destroyed represents so small a quantity as not to be calculable in terms of a day's meat ration.

. . . . . .

Pig Meat (Trichiniasis)

Dr. Morgan asked the Minister of Health whether, having regard to the occurrence of cases of trichiniasis recently in certain parts of Great Britain and the identification of pork and pork products as their cause, he will take steps to order the compulsory heating and cooking of all such products, especially those used in the making of sausages?

Mr. E. Brown: Investigations are at present in progress with regard to the occurrences in question. Publicity has been given to the matter by wireless and in the Press in which it has been pointed out that provided pig meat is thoroughly cooked, no risk will be run. In the circumstances I do not think that action on the lines suggested is necessary.

. . . . . .

Animal Feeding-stuffs (Rationing)

Major Sir George Davies asked the Minister of Agriculture whether he can make any statement in connection with the reduction announced to take effect next month in the value of the unit of animal feeding-stuffs under the rationing arrangements?

Mr. Hudson: Owing to increasing demands upon shipping space for the transport of essential war materials, further reductions in imports of animal feeding-stuffs must take place. In these circumstances steps have to be taken to effect a corresponding reduction in the releases of cereals and other concentrated food for livestock from April 1st. Coupons entitling the holder to purchase feeding-stuffs during each of the three months ending April 30th have already been issued to owners of livestock, and therefore the only way to effect a reduction in the quantities purchased is to reduce the value of the coupon unit as from April 1st. As from that date the unit will accordingly be reduced by 50 per cent., from 1 cwt. to 56 lb., and the reduction will apply both to the coupons valid for cereal foods and to those valid for protein foods. Special arrangements will be made, by the issue of additional coupons, to maintain as nearly as possible at their present scale the rations allowed to those classes of stock which, in the national interest, have been given first priority in the allocation of feeding-stuffs. These include dairy cows and working horses. It is proposed to make similar arrangements in respect of approved pedigree breeding stock of all kinds, and selected poultry stock; the selection of the latter will be carried out by an independent panel in each county. . . . .

The devaluation of the unit in April is the forerunner of other restrictions in the supply of feeding-stuffs. The scale of rations available in the summer months will involve still further reductions. Farm livestock draw the bulk of their sustenance in summer from grazing, and the management of grassland will this year be more important than ever. We cannot afford to allow any grass to be wasted. All pastures should be fully stocked, and the largest possible quantity of grass should be conserved for silage or hay to help to meet the inevitable deficiency in supplies of concentrates next autumn and winter.

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Pigeon Feeding-Stuffs

Mr. Mander asked the Parliamentary Secretary to the Ministry of Food what steps he is taking to supply a ration of feeding-stuffs to members of the National Homing Union; and whether he is aware of the grave difficulties being experienced by pigeon fanciers in feeding their birds which both actually and potentially are a valuable asset in our war effort?

Major Lloyd George: Owing to the limited shipping space available for bringing foodstuffs to this country it is not possible to provide food for pigeons except those that are registered for the National Pigeon Service, which are required for the fighting Services. A limited increase in membership of the National Pigeon Service has been authorised. I am sending to my hon. Friend copies of recent Press notices giving further particulars.

Mr. Mander: If the priority pigeon corn is now available for birds on active service, will the balance of existing stocks be made available for other pigeons which may be wanted for service later on?

Major Lloyd George: I am afraid I cannot hold out any hope of any balance existing, but the pigeons required for national service will be looked after.

Mr. Mander: Cannot the existing stocks be drawn upon for the other birds?

Major Lloyd George: There are other more important uses for existing stocks. There has been a very drastic cutting down in feeding-stuffs for pigs and poultry, and if there are any reserves they had better go there.

Mr. Cocks: Why is there a limitation imposed in the matter of national service, since a good many pigeon owners want to join and are not able to do so?

Major Lloyd George: The limitation is one of numbers, and is governed by the amount of pigeons required.

Mr. R. Gibson: Are feeding-stuffs earmarked for this purpose?

Mr. Maxton: Is the Minister aware that only 5 per cent. of the total number of homing pigeons are in national service, and that all the others available are now to be deprived of any feeding-stuffs?

Major Lloyd George: I am not sure about the figure which the hon. Member has given, but I appreciate that there is great hardship upon the people who have these birds. However, we have to deal with the situation as it is, and the fact is that the feeding-stuffs which are available can be better utilised in the national interest in other directions.

Mr. Mander: Are the birds to be destroyed?

NOTES AND NEWS

The Editor will be glad to receive items of professional interest for inclusion in these columns.

Diary of Events

Mar. 26th.—Fifty-seventh Annual General Meeting of the Western Counties Division, N.V.M.A., at Exeter, 2 p.m.
Mar. 26th.—Meeting of the Lancashire Division, N.V.M.A., at Preston, 2.15 p.m.
Mar. 27th.—Meeting of the Society of Veterinary Practitioners at Rugby, 2 p.m.
Mar. 28th.—Meeting of the Sussex Division, N.V.M.A., at Brighton, 2.30 p.m.
April 1st.—Morning Meeting of the Finance and General Purposes Committee, N.V.M.A., at 36, Gordon Square, London, W.C.1.
Afternoon **Meeting of Council, N.V.M.A.**, in London.

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NATIONAL SERVICE (ARMED FORCES) ACT SCHEDULE OF RESERVED OCCUPATIONS

Position of the Veterinary Surgeon

It will be remembered that the Council of the Royal College of Veterinary Surgeons at its meeting in July, 1940, resolved that it was advisable that veterinary surgeons should remain in the Schedule of Reserved Occupations, but that a tribunal should be set up to which any member who wished to serve in the Armed Forces could appeal so that if the tribunal found that his services as a veterinary surgeon were not vital to the needs of agriculture and food production he might be released for military service.

This resolution was communicated to the Ministry of Labour and the matter has been under consideration for some time. The Ministry has now decided that veterinary surgeons shall be permitted to volunteer for general service with His Majesty's Forces where such action would not be contrary to the National Interest. The Ministry consider that the National Interest could best be safeguarded if applications from veterinary surgeons to enlist for general service were submitted in the first instance to the Council of the Royal College of Veterinary Surgeons, and the Council were asked to send such applications with its observations to the Ministry of Agriculture and Fisheries, which Department would transmit them, together with its recommendations, to the Ministry of Labour.

The Council of the Royal College of Veterinary Surgeons has agreed to undertake this preliminary examination of applications, and has appointed a Special Committee for the purpose.

Members of the profession, therefore, who wish to volunteer for service in the Armed Forces of the Crown should send in their applications to the Secretary, R.C.V.S., 18, Victoria Avenue, Harrogate. The following particulars should be given:—

APPLICATION FOR WAIVER of the Schedule of Reserved Occupations by a Veterinary Surgeon wishing to volunteer for General Service in the Armed Forces.

1. Name.
2. Address.
3. Date of Birth.
4. Nationality.
5. If engaged in private practice state:—
   (i) Locality, extent and nature of practice;
   (ii) Has it increased or decreased during the last year?
   (iii) Do you employ assistants? If so, how many?
6. If employed under a contract of service (*e.g.*, as assistant, research worker, teacher, etc.), state:—
   (i) Name of employer.
   (ii) Number of other qualified veterinary surgeons, if any, employed at the same establishment.
7. Are you engaged in any capacity as veterinary inspector (whole-time or part-time) under the Ministry of Agriculture and Fisheries?
8. Are you doing any other veterinary work for Government or Local Authority, either paid or voluntary? If so, please give particulars.
9. What arrangements can be made for the carrying on of your practice or work during your absence, if you are accepted for services in the Forces?

Signature.....

Date.....

* * * * *

Supply of "The Veterinary Record" to Students

It was recently brought to the notice of the Association that a number of students were desirous of enjoying the privilege of having *The Veterinary Record* sent to them at a reduced charge. This matter was considered at the meeting of the Finance and General Purposes Committee held at York on March 10th, when it was resolved to make *The Veterinary Record* available in future to all students. This decision will have the effect of extending to all students the concession hitherto enjoyed only by the students who had passed their third professional examination.

In view of the increasing cost of publishing *The Veterinary Record*, the Committee have found it necessary to raise the fee for new student subscribers from £1 1s. 0d. to £1 5s. 0d.

From the Editorial Committee's point of view we welcome the decision, which will enable students to take advantage of the educational benefits to be derived from the regular perusal of the columns of this journal throughout their course of study.

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N.V.M.A. Watch Presentation Scheme

In response to requests from the secretaries of certain Divisions, the officers of the Association have decided to postpone the date for the return of cards till the last week in June.

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PERSONAL

We learn with much regret that Mr. Donald Campbell, ex-President of the N.V.M.A., was taken suddenly ill last week with a heart attack. Our readers will share our earnest hope that the period of six weeks' complete rest he has been ordered to take will see him restored to a full measure of health and strength.

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RATIONING ARRANGEMENTS FOR HORSES IN VETERINARY INFIRMARIES

In connection with the above, the Association recently addressed to the Animal Feeding-Stuffs Division of the Ministry of Food a request for information as to whether any machinery existed whereby a veterinary surgeon could draw a basic ration for the "floating population" of horses in his infirmary—bran being the food of particular interest in this regard. The Secretary's communication proceeded: "The Association cannot see that it should be difficult in the case of urban horses sent to a veterinary infirmary to arrange that the necessary ration should accompany the horse. It is when a horse is sent to a veterinary infirmary from a considerable distance that the question of obtaining rations becomes a difficult one."

In reply, the Ministry stated that it was considered that in the event of an animal being sent to a veterinary infirmary, whether by van or otherwise, the necessary feeding-stuffs might be sent with the horse. If the transport of feeding-stuffs was not possible, however, and a special purchase of bran was desired, application

should be made to the Divisional Feeding-Stuffs Executive Officer for the division concerned. A list of such officers was enclosed and is as follows:—

Divisional Feeding-Stuffs Officers

England and Wales

	Divisional Executive Officer.	*Assistant Divisional Executive Officer.*
Northern:	G. Smith, Esq., Pilgrim House, Pilgrim Street, Newcastle-on-Tyne. Tel.: Newcastle 22002.	F. Barker, Esq.
North Eastern:	F. Keighley, Esq. City of Leeds School, Woodhouse Lane, Leeds, 2. Tel.: Leeds 31473. Ext. 20	C. H. W. Price, Esq.
North Midland:	A. L. Martin, Esq., Elmhurst, Cavendish Road, East, The Park, Nottingham. Tel.: Nottingham 45511.	A. T. Hitt, Esq.
Eastern I:	K. B. V. Cook, Esq. (Acting), 17, Hills Road, Cambridge. Tel.: Cambridge 56517, 54477	K. B. V. Cook, Esq.
Eastern II:	N. Adams, Esq., Cathedral School, Victoria Road, Chelmsford, Essex. Tel.: Chelmsford 4444/7.	T. H. Duffell, Esq.
London:	F. Berry, Esq., 9 & 10, Savile Row, Regent Street, London, W.1. Tel.: Regent 6711.	S. E. Tidy, Esq.
South Eastern:	H. C. Macnab, Esq., Mount Ephraim House, Mount Ephraim, Tunbridge Wells. Tel.: Tunbridge Wells 3436/9.	H. T. Brook, Esq.
Southern:	J. R. Kempe, Esq., "Parkhurst," 78, Bath Road, Reading, Berks. Tel.: Reading 60449, 60448, 60440, 60255.	T. P. Booth, Esq.
South Western:	S. Oncken, Esq., 11, Belgrave Road, Bristol, 8. Tel.: Bristol 34431.	W. H. Longhurst, Esq.
South Wales:	S. J. Booer, Esq., 59, Cathedral Road, Cardiff. Tel.: Cardiff 8012.	E. T. Williams, Esq.
Midland:	D. R. Luton, Esq., Cavendish House, Waterloo Street, Birmingham. Tel.: Central 1859 & 1850.	A. B. Eagles, Esq.
North Wales:	A. M. Wedd, Esq., 30, Bangor Street, Caernarvon. Tel.: Carnarvon 561, Ext. 12.	I. Owen, Esq.
North Western:	G. Bentham, Esq., Africa House, Whitworth Street, Manchester, 1. Tel.: Central 0019.	S. B. Young, Esq.

Scotland

Chief Feeding-Stuffs Executive Officer: J. R. B. Cassie, Esq., 46, Moray Place, Edinburgh. Tel.: Edinburgh 33581, 23216.

	Divisional Executive Officer.	*Assistant Divisional Executive Officer.*
South East:	R. F. Heiton, Esq., 46, Moray Place, Edinburgh, 3. Tel.: Edinburgh 33581, 23216.	Vacant.
East:	A. K. Mann, Esq., 56, Reform Street, Dundee. Tel.: Dundee 2584.	——
North East:	W. D. Beveridge, Esq., 15, Albyn Place, Aberdeen.	——
West:	R. D. Forbes, Esq., 53, Bothwell Street, Glasgow, C.2. Tel.: Central 2949.	Vacant.
North:	F. R. Lees, Esq., 11, Queensgate, Inverness. Tel.: Inverness 1316.	——

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FOOT-AND-MOUTH DISEASE

Restrictions in Many Counties

On Thursday of last week it was announced that the Minister of Agriculture had made an Order applying the provisions of the Foot-and-Mouth Disease (Controlled Areas Restrictions) General Order of 1938 to the counties of Chester, Derby, Stafford, Salop, Warwick, Worcester, Hereford, Radnor, Brecon, Glamorgan, Monmouth, Gloucester and Flint, and parts of the counties of Lancaster and Denbigh.

"The Order," it was stated, "does not apply to those parts of the counties which are already subjected to infected area restrictions. It is designed to control the movement of animals into, within, and out of the areas, and requires that no market or sale of animals shall be held in the area except such as are restricted to fatstock for immediate slaughter and are licensed by the local authority. It is a purely precautionary measure to prevent the spread of disease to other parts of the country and was necessary because animals affected by the disease have been widely distributed in the area in question from a market in that area. There is some reason to fear that other markets may already have become infected.

"It is hoped that these measures will be effective and that it will not be necessary to keep them in operation long."

. . . . .

Foot-and-mouth disease has been confirmed among cattle at Lea, near Malmesbury, at Dudley, Worcestershire, at Stoke Bliss, Tenbury, and at Haselbury, Plucknett, Somerset.

. . . . .

Control Policy

In the course of a communication on the above published in a recent issue of *The Times*, Sir Joseph A. Arkwright, Chairman of the Foot-and-Mouth Disease Research Committee of the Ministry of Agriculture and Fisheries, observes: "The recent letters appearing in *The Times* and elsewhere condemning the slaughter policy for dealing with foot-and-mouth disease have relied on two fallacies: (1) That slaughter has in the past not prevented extension of the disease nor reduced the resulting public expenditure; (2) That scientific research has not been actively carried on in this country or has been on wrong lines.

"Regarding the first, the cost to the public and herd-owners in countries where reliance has been placed on isolation and treatment has been shown repeatedly to be far greater than in this country. Account must be taken of the almost universal spread of epidemics and of endemic persistence when attempts are made to combat the disease by isolation, as has been done in France and Holland.

"In the second place, scientific research has been continuously carried on, and resulting advance in knowledge of the disease has been considerable, as is evident from the contents of the five progress reports of the Foot-and-Mouth Disease Research Committee. This is acknowledged, but [this has reference to a published communication from Dr. W. M. Crofton—Editor, *V.R.*] Dr. Crofton would prefer that all the exact and detailed knowledge of virus diseases, including foot-and-mouth disease, should be ignored in favour of a doctrine which he advocates but which in the case of foot-and-mouth

disease has been repeatedly disproved and rests purely on unsupported assertions, and is, moreover, at variance with all accepted scientific opinion. The Research Committee has examined such evidence as Dr. Crofton has been able to produce and found it quite unconvincing. Opposed to his statement that he has never been given any opportunity in this country to prove his thesis that a bacillus is of importance in the causation of foot-and-mouth disease is the fact that in 1939 he was given facilities for culture of his bacillus from foot-and-mouth disease lymph and its inoculation into guinea-pigs in accordance with his own proposals. The experiment was a complete failure, the results of inoculation being entirely negative both as regards infection and protection."

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DUBLIN COLLEGE CLASS PRIZES DISTRIBUTION

Class prizes won during the 1939-1940 session in the Royal Veterinary College, Dublin, were presented to the successful students on March 5th by Professor T. G. Browne, Principal of the College.

The following is a list of the winners of medals according to subject:—Medicine—Silver medal, A. O'Hagan; bronze medal, C. O'Leary. Clinique—Silver medal, P. J. Murphy. Meat inspection—Bronze medal, J. Buckhardt. Surgery—Silver medal, S. Hutch; bronze medal, A. O'Hagan. Obstetrics—Bronze medal, A. O'Hagan. Pathology—Silver medal, B. Whitty; bronze medal, M. S. Howe. Keogh medal, Freeman medal and Mettam medal—B. Whitty. Parasitology—Silver medal, J. Carlisle; bronze medal, B. Whitty. Senior Anatomy—Silver medal, B. A. McErlean; bronze medal, H. Thornberry. Junior Anatomy—Silver medal, W. R. Kelly; bronze medal, R. P. Lee. Materia Medica—Silver medal, B. A. McErlean; bronze medal, D. Burgess. Hygiene—Silver medal, D. Burgess; bronze medal, B. A. McErlean. Physiology—Silver medal, W. R. Kelly; bronze medal, J. Huey. Histology—Silver medal, W. R. Kelly; bronze medal, R. Carmichael. Animal Husbandry—Silver medal, J. J. McGarry; bronze medal, R. Carmichael. Chemistry—Silver medal, W. J. Mullin; bronze medal, G. Dancey. Practical Chemistry—Bronze medal, T. G. Hunt. Biology—Silver medal, R. Gilmore; bronze medal, W. J. Mullin. The bursary of £25 was awarded to W. J. Mullin for the highest marks in the first year, and the V.M.A.I. medal to C. O'Leary, who obtained first place in the final examination.

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MINISTRY OF AGRICULTURE NEWS SERVICE

The Rationing Scheme for Livestock

Ensuring Fair Treatment for the Small Farmer.—It was never expected that the rationing scheme for livestock would start off with 100 per cent. efficiency. But with the growing shortage of imported feeding-stuffs, a shortage that is bound to become worse, it seemed essential to secure fair distribution of the limited supplies. For the small farmer, especially if he could not pay "on the nail," was often finding it difficult to get any feeding-stuffs at all when there was no rationing.

On the whole, the scheme has made a considerably better start than many expected, in spite of individual cases of hardship and anomaly. In some counties there was a little delay in issuing coupons, and where County Committees were unable to despatch all the coupons before February 1st, merchants were authorised to supply a fortnight's feeding-stuffs to farmers on a promise to deposit the coupons when received. There is also some misunderstanding about the position of the "surplus" farmer who has sold or used more feeding-stuffs than the estimated surplus that he was required to sell before he could qualify for coupons. These excess sales before the scheme started are not regarded as establishing a credit against which coupons for later use can be drawn. But any farmer, whether surplus or deficit, who has sold or who has used or reserved for seed so large a proportion of his grain that he has insufficient supplies remaining to make up, with the purchased supplies allowed to him, the requirements of his livestock, may obtain from his County War Committee an additional issue to make up the difference.

County Committees have been authorised to issue coupons to the extent of a month's requirements to any surplus farmer who claims that he is without supplies. The allowance will be adjusted subsequently when the Committee has obtained the necessary particulars and calculated the coupons to which the farmer is entitled for the quarter. This should prevent delay in obtaining feeding-stuffs where the number of applications for supplementary issues is so great that the Committee cannot handle them as quickly as they and the farmers would wish.

The Ministry has been particularly pleased to receive a number of reports from small farmers who, under rationing, are now receiving better supplies of feeding-stuffs than they had before. One of the main objects of the scheme was to distribute the available supplies fairly.

. . . . .

Farming To-day and in the Last War

We are better equipped now for breaking and making Pasture.—Drills are busy in the south of England now, sowing the spring corn, if conditions permit, on arable acres that have grown even broader. Thanks to knowledge about grassland we have gained since the last war, we know now that these ploughed acres can one day become better grass than many of them ever were before. The old saying that "to break a pasture makes a man; to make a pasture breaks a man" no longer has any meaning.

Yet it is interesting to turn back to the last war and read in the accounts of those times how, even then, many were advocating ploughing up for much the same reasons as to-day, apart, of course, from the national need to grow more food. They were in favour of ploughing because much of the grass was bad and unproductive, because it would benefit the soil, because stock would thrive better on food grown on their own farm. "What is wanted," they were saying 25 years ago, "is for each farmer to grow more of his requirements on his own farm. There are certain farms producing less than the average. This style of farming cannot be tolerated." So wrote a Lancashire squire. There were many complaints of the shortage of skilled labour, for then a far greater number of ploughmen had been called to the Colours than anyone contemplates to-day. They were also more troubled by the weather, for there were practically no tractors to take advantage of the favourable spells. Many were complaining about the damage done by rabbits and game, for, apparently, the County War Committees of the last war had not the powers the Committees now possess to insist upon the extermination of vermin.

On the whole, it is encouraging to glance back at farming during the last war. For what are perhaps the two greatest additions to our agricultural knowledge since then have been the extended use of power in farming and the improved technique of grassland management. We are, in fact, considerably better equipped than our fathers for both pasture-breaking and pasture-making, and nothing could be more useful at the present time.

CORRESPONDENCE

Letters to the Editor should reach the Office not later than by the first post on Tuesday morning for insertion in following Saturday's issue.

The views expressed in letters addressed to the Editor represent the personal view of the writer only and must not be taken as expressing the opinion or having received the approval of the N.V.M.A.

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CONTROL OF DISEASES OF LIVESTOCK

To the Editor of the Veterinary Record

Sir,—It is to be hoped that the profession will carefully study the N.V.M.A. Survey Committee's Report and "Plan for the Control of Mastitis, Contagious Abortion, Sterility and Johne's Disease." In its preamble the

Committee express the opinion that a State-administered system of quarterly visits by the veterinary surgeon to the farm will "materially improve upon the prevailing practice of giving professional advice at a comparatively *late stage* in the development of disease and would enable the practitioner to advise the farmer upon its prevention or control at an *early stage*" (my italics). We may be able to differentiate the early from the late stage of a particular disease in a particular animal, or of a particular epidemic in a herd. Under such circumstances we are dealing with events which have a beginning and an end. But the four diseases dealt with by the Committee are endemic; they are processes, not events in a herd; their beginning is indefinable and their end is beyond the powers of prognosis. They are inherent in the existing system of dairy farming.

The nature of these four diseases and the present system of dairy farming are commensal, the one draws sustenance from the other; each is cause and effect; without the one the other is not. This is the fundamental problem we face to-day, but the Committee do not face up to it, they appear to think that by telling us how to do this and not to do the other thing the problem will solve itself.

Before setting down our methods for its treatment we should have a clear conception of the nature or pathogenesis of mastitis and of its diagnosis. The Committee appear to regard mastitis as an entity, they rivet their gaze upon the udder and overlook the cow. I regard mastitis as the local manifestation of a generalised infection. It is the common, but by no means the invariable, expression of the activity of certain organisms within the cow. On how many occasions is mastitis preceded or accompanied by the metritis and polyarthritis syndrome of the "felloned" cow, or by cellulitis, impetigo, abscesses, lacerations, etc.? Moreover, the pneumonias and pyaemias among young bovines remind us that the organisms endemic in the herd are not confined to the milking stock. The clinical and pathological signs of the causal organisms in young and adult cattle are protean, whether the organisms be the *beta-, alpha-*, or non-haemolytic streptococcus, *B. pyogenes* or staphylococcus. Thus the identity of the organism is essential for accurate diagnosis and for enlightened treatment.

I do not quarrel with the Committee for acknowledging the fact that few farmers care or will pay for laboratory tests; they recognise that the identity of organisms cannot be established by clinical methods. But I quarrel with them for implying that since one species of streptococcus is the most prevalent we should base our methods of treatment on this one organism and ignore the other four. And that, Mr. Editor, is what we are invited to accept as the basis of a State-administered plan for controlling mastitis.

Frequently laboratory tests of milk samples reveal two, and not uncommonly three, different causal organisms operating concurrently in a herd. Not infrequently in my experience a cow infected by one organism recovers (bacteriologically and clinically) following treatment, and then after several weeks of normality, she becomes infected by another species of the "mastitis" organisms. Only by laboratory tests can we acquire this significant information.

For the basis of our specific treatment of mastitis, which many of us prefer to adopt, we have autogenous vaccine. Though conceding its efficacy for *B. pyogenes* or staphylococcus, the Committee does not recommend its use; it definitely excludes vaccine for the streptococci. Some of us on the contrary are convinced of its value by long experience, but in the Committee's view vaccine is a bad thing, whereas sulphonamide is a good thing. Yes, it is, in the acute septicaemic stage, but how very rarely do we meet with this phase in the cow? On other than the bacteraemic phase of the infection sulphonamide is a dud. We are in danger of becoming the high priests of a sulphonamide cult. It is strange that the Committee should discard accurate laboratory diagnosis on grounds of expense and should adopt a very expensive drug, which has a very limited value in mastitis. If the Committee can adjudicate on vaccines and sulphonamide, why did it overlook the valuable evidence on the synergic action of autogenous vaccine combined with sulphonamide? According to the Committee irrigation of the udder is definitely a good thing; shades of R. J. Hickes!!

The Committee cannot ignore the necessity for diagnosing contagious abortion by laboratory methods as they do for mastitis. Upon the treatment of abortion the Committee leave us to our own devices with a gentle hint that dead vaccine is a bad thing, whereas attenuated living vaccine is a good thing. Living vaccine has many champions among our profession; it certainly increases the calf-crop, but it fails to reduce the incidence of the disease, it increases the sterility rate in cows and the morbidity rate in calves, and it increases the risk to consumers of raw milk. However modest its achievements, I prefer the use of dead vaccine at quarterly intervals.

Until we have better weapons against contagious abortion we shall make little impression upon sterility, which is largely the outcome of natural or artificial infection with the organisms of contagious abortion. The Committee, adopting its now familiar tactics, ignores the snags in controlling sterility by telling us how to treat "temporary infertility." Such a term has no pathological significance; it is merely another way of saying that as a result of, or despite, treatment, the cow has conceived. You see now, Mr. Editor, why the "sterile" cow is sold; she won't play the game.

The Committee does not make it clear that the practitioner is usually called in to deal with "scours," not with Johne's disease. In my experience the examination of the dung of such cattle reveals worms far more frequently than Johne's bacilli, with coccidiosis a close third. In order of practical importance examination of the faeces precedes the johnin test; and once again I say that methods of control should be built up on accurate diagnosis.

I quarrel with the Committee, not for advising isolation or quarantine, but for their failure to make clear that these admirable measures are not practicable on most farms; also for their failure to make clear that the four endemic diseases are inherent in the husbandry and economics of dairy farming. Relatively few dairy cattle are in "closed herds." The maintenance of "flying herds" depends upon the movement of stock by marketing, which in turn maintains endemic disease. We are up against the vicious cycle of the three M.'s—Maintenance, Marketing, Morbidity. We are up against the stern realities of agricultural economics. I understand that of the 300,000 farmers in Great Britain approximately 110,000 do not make a net income of more than £100 to £300 a year, with some 134,000 merely subsisting at labourers' standards or less. These figures appear to indicate that five out of six farmers have not the means of departing from the established system of their business, consequently the requisite changes must be effected by the more affluent 55,000. Revolution in agricultural business methods is the *quid pro quo* we veterinary surgeons should claim for our signature to the Committee's bond. Here is the bond:—

"If some plan as this is put into *immediate* operation the production of meat and milk will considerably increase and much of the huge loss associated with these diseases (about £20 million) avoided, *a substantial reduction being achieved within a comparatively short time*" (my italics). I admit that this quotation of the Committee's preamble is the salvationist's slogan "Come to us to be saved," nevertheless it is a solemn promise to the farmer.

If the Committee have their way it is the private practitioner who will have to give this promise to his clients. In other words, private practitioners are to be converted into a public utility company of unlimited liability.

In the event of failure, who honours the bond? I am

under the impression that it cannot be the N.V.M.A., the A.R.C., or the Ministry of Agriculture. The only venerable institution upon whom the farmer can vent his indignation is his private practitioner, who has a front to persuade and a behind to be kicked. The private practitioner may be tempted to think that he could save his behind if the Committee's plan were made compulsory, but its compulsory application does not repair its defects.

No laudable intentions, no elevated sentiments, no oratorical appeals will move me into giving a promise which I know I cannot fulfil.

I am, Sir,
Your obedient servant,
TOM HARE.

St. Albans.
March 6th, 1941.

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TO THE EDITOR OF THE VETERINARY RECORD

Sir,—Mr. Steele-Bodger and his Survey Committee have been successful in soliciting the sympathy of the Government for the cause of the veterinary profession. For this service and for their excellent report the Committee must be congratulated.

One cannot, however, read their recommendations without a feeling of uneasiness. Are we justified in putting forward these proposals to the Government and farming community in view of the present state of veterinary knowledge relating to the diseases dealt with in the report?

I am not aware that any large-scale controlled field experiments have ever been carried out illustrating the efficacy of udder infusions and sulphanilamide therapy in the treatment of mastitis. To quote one of the manufacturers of sulphonamide compounds in a recent publication, ". . . In chronic contagious mastitis caused by *Str. agalactiae*, however, results have been less favourable. The administration of large doses of sulphanilamide to cows over fairly long periods results in definite clinical improvement and may cure perhaps 50 per cent. of cases, but in others there is only a transitory decrease in the number of streptococci and leucocytes in the milk and relapse frequently follows stopping of the treatment."

With regard to contagious abortion, the Committee has not yet decided which vaccine is to be used. Why is this? Again, I think, because the various vaccines have not been tried out on a sufficiently large scale in controlled field experiments.

In the field of sterility, one is more hopeful. No doubt veterinarians trained in the diseases of the genital organs of domestic animals could do a lot towards reducing breeding trouble in cattle. It will take time to train these specialists.

The Committee seems to believe that in view of the special urgency of the present situation some sort of attack on the above diseases should be begun at once, however modest the start. The small part the veterinary surgeon has so far been allowed to play no doubt contributes to this desire to do something at once, and has been put forward as an argument for implementing the scheme forthwith.

I believe that the time is most opportune, not to embark on an uncertain scheme, but to increase our efforts to further our knowledge of cattle diseases by intensive research, coupled with large-scale field experiments. A special course in the curriculum of the R.C.V.S. on the diseases associated with reproduction in farm animals would also appear to be indicated.

The agricultural community will judge the profession by the success or failure of any veterinary scheme. We cannot afford to fail. When we have accumulated sufficient professional knowledge we can go ahead.

I am, Sir,
Yours faithfully,
G. H. ARTHUR.

2a, Pembroke Gardens,
Liverpool, 3.
March 5th, 1941.

CONTROLLED REDUCTION OF FARM STOCK AND PLANNED RE-STOCKING

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—I wish to endorse the suggestion made by Mr. J. C. Grant, that reduction in farm stock be made the opportunity to eradicate undesirable animals, and would also urge that guidance to farmers in re-stocking should be provided, so that controllable disease shall not again be allowed to reach proportions that render it uncontrollable without grave economic disturbance.

This is particularly important in the case of stock such as pigs and poultry which can be rapidly expanded. As a result of lack of veterinary supervision disease is rampant in the poultry industry, and on many farms 50 per cent. of pullets die before they are a year old. I am under the impression that a 90 per cent. purge would be required before serious disease, the most important of which is fowl paralysis, could be eradicated.

There are indications that fowls raised in isolation on clean land can remain free from serious disease, and with a reduction to a sixth of their pre-war stock it should become possible for farmers to rest land for future use in raising clean birds. Poultry farmers will, however, require advice on carrying out measures of isolation, and close co-operation must be established between the industry and the veterinary profession. Unfortunately a class of poultry instructors has been allowed to grow up and interpose itself between the farmer and the veterinary expert. It appears to be quite an unnecessary cog in the poultry economic machine, and should be eliminated as soon as possible, in the meantime being placed under veterinary supervision. It is admitted that the greater part of the instructor's time "is taken up by assisting poultry-keepers in connection with outbreaks of disease."•

In order to ensure that a supply of healthy birds is available for eventual re-stocking, Government control of all large hatcheries should be established for two or three years, and only eggs from flocks which can be proved to have a satisfactory health record for all birds between one month and one year old should be accepted for hatching.

Yours faithfully,
U. F. RICHARDSON.

110, Craiglea Drive,
Edinburgh, 10.
March 5th, 1941.

•Report of Poultry Technical Committee of Great Britain, 1938.

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ARMY MEAT INSPECTION

TO THE EDITOR OF THE VETERINARY RECORD

Sir,—Now that greater use is to be made of the R.A.V.C. in connection with remount work, one wonders how long it will be before that Corps is given full control of army meat inspection?

Some years ago I was asked to draw up a syllabus and conduct a course for a certain number of officers and warrant officers of the Indian Army. The course consisted of lectures and practical work on cattle rearing, slaughtering, the utilisation of by-products and some meat inspection.

The students were all R.A.S.C. personnel, and were especially keen to learn the meat inspection part of their course. When I pointed out to them that R.A.V.C. officers would surely be available to deal with that aspect of their proposed duties, I was informed that the R.A.S.C. were expected to attend to meat inspection and that it was usually carried out by members of that corps who held no special qualifications whatever. I understand that is the position prevailing throughout the British Army as well as the Indian Army.

Yours obediently,
D. J. ANTHONY.

High Lodge,
Iverley,
Stourbridge.
March 10th, 1941.